

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P651354WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB01/02133	International filing date (day/month/year) 16/05/2001	Priority date (day/month/year) 19/05/2000
International Patent Classification (IPC) or national classification and IPC A63B71/00		
Applicant ARMADILLO SPORTS DESIGN LIMITED et al.		



- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 10 sheets.

- This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 07/12/2001	Date of completion of this report 02.09.2002
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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB01/02133

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1,2,5-7,10,13	as originally filed		
3,4,8,9,11,12	as received on	24/06/2002	with letter of 24/06/2002

Claims, No.:

1-18	as received on	24/06/2002	with letter of 24/06/2002
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Drawings, sheets:

1/15-15/15	as originally filed
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2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

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- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims
	No:	Claims 1,2,4,5,9,10,15,
Inventive step (IS)	Yes:	Claims
	No:	Claims 3,6-8,11-14,16-18
Industrial applicability (IA)	Yes:	Claims 1-18
	No:	Claims

2. Citations and explanations
see separate sheet

ITEM V

- 1.1** The subject-matter of claims 1, 2, 4, 5, 9, 10 and 15 is already known from document **D1**: GB-A-2 328 859 (see page 7, line 14 - line 24, figures 11 and 12).

Therefore the present application does not satisfy the criterion set forth in Article 33(2) PCT because the subject-matter of Claims 1, 2, 4, 5, 9, 10 and 15 is not new in respect of prior art as defined in the regulations (Rule 64(1)-(3) PCT).

- 1.2** Under due consideration of the general knowledge of the man skilled in the art working in the field relating to protective sportswear, dependent claims 3,6-8,11-14,16-18 do not appear to contain any additional features which involve an inventive step when combined with the subject-matter of any claim to which they refer.

- 2.1** The independent claim have not been properly cast out in the two-part form, with those features which in combination are part of the prior art document (**D1**) being placed into the preamble. The claim, therefore, do not meet the requirements of Rule 6.3(b) PCT.

- 2.2** The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

- 2.3** The document **D1** has been identified in the description but the relevant background art disclosed therein has not been correctly discussed. The requirements of Rule 5.1(a)(ii) PCT are, thus, not fulfilled.

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According to the present invention, an appliance for protection against impact and strain injury includes a plurality of mutually overlapping interconnected plates of an impact resistant material attached to or adapted to be attached to an article to be worn about a part of the body such as to permit limited relative movement between the plates; characterised in that at least some of the plates are aligned and movable along a common backing member; and in that means are provided for removably mounting the appliance on an article to be worn.

The backing member may be one or more ligaments extending centrally or in spaced disposition along the appliance.

At least two of the interconnected plates may be mounted in fixed relative disposition along the backing member.

The backing member may be elasticated.

The backing member may form, or include a fastener thus to be removably attachable to a part of a garment.

The backing member may form, or include, one part of a strip of hook and loop fastener thus to be removably attachable to a part of a garment.

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The appliance may be contained within a sleeve removably or permanently attached to a garment.

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:-

Fig. 1 illustrates a known appliance for protection against impact and strain injury, such as is described in GB 2328859;

Fig. 2 is an enlarged view of part of the appliance of Fig. 1;

Fig. 3 illustrates an appliance made in accordance with the invention and shows a means of attachment of the appliance to a garment;

Fig. 4 illustrates another means of attachment;

Fig. 5 shows an example of the appliance in use on a glove;

Fig. 6 shows an example of the appliance in use as a lower leg protector;

Fig. 7 shows a further example of the appliance in use as a lower leg protector;

Fig. 8 is a front view showing an example of the appliance in use on a unitard;

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from, the garment. The plates 15 are aligned and movable along the ligament 16 as will be described, so that the stitching 17 is omitted.

Figure 2 illustrates, for example, a shoulder protection appliance such that the plates 15 follow the line of the shoulder and the upper arm to protect that region of the body from impact injury.

Alternatively, an appliance such as shown in Fig. 2 can be located directly over the leg in the area of the shin thus to act as a shin protector, or to any other area of the body to be protected.

The ligament 16 may be elasticated so as to maintain the plates 15 in the correct relative orientation but allowing for relative movement between them as the appliance bends, due to the flexible and resilient nature of the ligament.

In place of the VELCRO fastener tapes 18, the ends of the ligament may be removably attached to a garment, and replaceable thereon, by means of adhesive tapes, press studs or the like. By making the appliance detachable it can be replaced by one having different properties of rigidity or flexibility, or when worn or damaged.

Referring now to Fig. 3, there is illustrated a part of a garment with which the appliance is to be used, for example, an elasticated knee support sleeve 19. A strip 20 of

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VELCRO may be permanently attached to the sleeve 19 and the ligament 16 may have spaced apart VELCRO tabs 21 as shown.

Referring now to Fig. 4, in this example the appliance is wholly enclosed within a mesh pouch 22 closed by VELCRO strips 23 attachable to VELCRO strips 24 permanently affixed to the sleeve 19. In this case, there is no need for the user to wear additional clothing outside the pouch 22 unlike the embodiment in Fig. 3 where it may be considered necessary or desirable to wear another sock outside the appliance.

Referring now to Fig. 5, there is shown an example where several strips of the appliance are attached to the back of a glove 25 thus to protect the wearer's hand against crush injury.

Referring now to Fig. 6, in this example an elastic sock 26 has attached thereto several lengths of the appliance for example for a shin guard 27, ankle guards 28 and a further guard 29 at the rear to protect the Achilles tendon region.

Referring now to Fig. 7, there is shown an alternative arrangement in which a number of the appliances are attached to the sock 26 by insertion into mesh pockets 27 similar to that described in relation to Fig. 4, such that the appliances may be introduced selectively according to user requirements.

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Referring now to Fig. 14, there is shown a complete lower leg protector comprising a flexible sock 45 upon which are mounted several appliances 46 two in the calf region, one in the frontal shin region and one in the upper heel region.

The appliances 46 are removably attached to the sock 45 as will be described, and a further pair of appliances 47 may be non-removably mounted on both sides of the ankle region.

Referring now to Fig. 15, the plates shown here at 48 are individually threaded as at 49 onto a single flexible tape or ligament 50. The two end plates are preferably stitched or otherwise permanently attached to the ligament 50 as shown at 51. A strip 52 of VELCRO is applied over the ligament 50 and may have a self-adhesive backing surface 53 thus to become bonded to the ligament 50 and each of the plates 48. If required, the strip 52 may also be stitched as at 54 to the outermost end plates 48. Thus, the appliance is self-contained and attachable to the sock 45 bearing the corresponding strip 55 of VELCRO, preferably stitched to the sock 45, or to any other sleeve or garment bearing such a strip as illustrated at 55 in Fig. 14.

Thus, the appliances 46 are removable from the sock 45 for washing and for replacement if they become damaged. Removability of the appliances 46 enable the wearer to select the required impact resistant characteristics. For this purpose, appliances having a variety of levels of rigidity may be made available.

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Referring now to Fig. 16, in an alternative arrangement the ligament 50 is replaced directly by a strip 56 of VELCRO upon which the plates 48 are threadedly engaged. In some cases the surface characteristics of the VELCRO strip are sufficient to retain the plates 48 in fixed relative disposition along the strip but for additional security the two end plates may be stitched to the strip.

Optionally, press studs or further VELCRO fixings 57 may be located in the side regions of the end plate 48 to become engaged with the sock or garment thus to provide additional security preventing the side edges of the plates from lifting in use. Such additional fixings may be provided on some or all of the plates 48.

Referring now to Fig. 17, it will be seen that the plates 15 may be threadedly mounted on a pair of ligaments 60 (which may be elasticated or strips of velcro) arranged in spaced parallel disposition along the appliance, thus to assist in the prevention of the individual plates from twisting or rotating, but still affording adequate relative movement between them. Two ligaments also serve to prevent the side regions of the plates from lifting and maintain the assembly of plates in correct alignment and degree of overlap. Alternatively, a single broad ligament can be provided.

The appliances may be made available in a number of different thicknesses or grades of rigidity and strength. For example, a user having a recent injury may apply a thicker or heavier grade of appliance initially and then reduce its thickness and weight during the recovery period.

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CLAIMS

1. An appliance for protection against impact and strain injury including a plurality of mutually overlapping interconnected plates of an impact-resistant material attached to or adapted to be attached to an article to be worn about a part of the body such as to permit limited relative movement between the plates; characterised in that at least some of the plates are aligned and movable along a common backing member; and in that means are provided for removably mounting the appliance on an article to be worn.
2. An appliance according to Claim 1, wherein the backing member is a ligament extending centrally along the appliance.
3. An appliance according to Claim 1, wherein the backing member is comprised by two or more ligaments extending along the appliance in spaced disposition.
4. An appliance according to any preceding claim, wherein at least two of the interconnected plates are mounted in fixed relative disposition along the backing member.
5. An appliance according to any preceding claim, wherein the backing member is elasticated.

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6. An appliance according to any preceding claim, wherein the backing member forms, or includes, a fastener thus to be removably attachable to a part of the garment.
7. An appliance according to Claim 6, wherein the fastener is a hook and loop fastener.
8. An appliance according to any preceding claim, contained within a sleeve removably or permanently attached to a garment.
9. An appliance according to Claim 4, wherein said at least two of the interconnected plates are attached by stitching to the backing member.
10. An appliance according to any preceding claim, wherein at least some of the plates have loops and are threadedly mounted on the backing member.
11. An appliance according to Claim 7, wherein a strip of the hook and loop fastener extends along and is attached to the backing member.
12. An appliance according to Claim 11, wherein the strip of hook and loop fastener has a self-adhesive backing for attachment to the backing member.

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13. An appliance according to Claim 8, wherein the sleeve is open-ended to receive the appliance, the open end or ends being closable by a strip of hook and loop fastener.
14. An appliance according to any preceding claim, wherein several strips of such appliance are removably attached to the back of a glove.
15. An appliance according to any one of Claims 1 to 13, wherein several strips of such appliance are attached to a sock thus selectively to provide a shin guard, ankle guard or a guard at the rear to protect the Achilles tendon region.
16. An appliance according to any preceding claim, wherein the or at least some of the interconnected plates are formed such as to consist individually of an outer shell and an inner core having, relative to the outer shell, more highly impact-resistant properties.
17. An appliance according to Claim 1, wherein the backing member is formed at least one strip of hook and loop fastener with the interconnected plates threadedly engaged thereon in mutually overlapping relationship.

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18. An appliance according to Claim 1, wherein the backing member extends centrally along the row of interconnected plates, and further fastening means are provided removably to fasten outer side regions of at least some of said plates to a garment thus to prevent said side regions from lifting in use.